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# CASE HISTORY



## Potable water pipe for city in Peru

<b>Market Segment:</b>	Pipes
<b>Composite Application:</b>	Potable water pipe
<b>Resin:</b>	Vipel® unsaturated polyester
<b>Manufacturing Process:</b>	Continuous filament winding
<b>Diameter:</b>	43 inches (1100 millimeters) 47 inches (1200 millimeters) 51 inches (1300 millimeters)
<b>Pressure Requirements:</b>	145 to 145 to 464 pounds per square inch (10 to 32 bar)
<b>Length:</b>	1.9 miles (3.1kilometers)
<b>Installed:</b>	2011
<b>Location:</b>	Arequipa City, Peru

With a broad industrial base, historic architecture and rugged surroundings, Arequipa City, Peru, is a popular destination for both commerce and tourism. The city's strategy for growth includes a Master Plan for improving and expanding its potable water network.

The expansion uses 1.9 miles (3.1 kilometers) of Flowtite™ fiber-reinforced polymer (FRP) composite pipe manufactured by O-Tek Internacional S.A. using a using a Vipel® unsaturated polyester from AOC.

The gravity-flow pipeline conveys water from an intake in the Chili River to the La Tomilla II water treatment plant. La Tomilla II's first stage is designed to handle 34.2 million gallons/day (1.5 cubic meters/second).



*The lightweight of Flowtite™ composite pipe allowed the pipe to be installed without the use of heavy cranes.*



*The project to expand the potable water supply for Arequipa City uses 9.8 kilometers (6.1 miles) of composite pipe.*

Three different pipe diameters were used: 43 inches (1100 millimeters), 47 inches (1200 millimeters) and 51 inches (1300 millimeters). Internal pressure requirements range from 145 to 464 pounds per square inch (10 to 32 bar).

### Two tunnel design

A special project feature is how pipe installation included two independent tunnel segments. In one tunnel – 623 feet (190 meters) in length – the pipe is installed as an interior liner.

As a result, the pipe is not affected by internal water pressure loads or external soil pressure loads. The other tunnel – 4,167 feet (1,270 meters long) – uses aerial pipe installation according to manufacturer recommendations.

Because the high strength composite pipe weighs less than metal or concrete alternatives, transportation and installation were easier and lower cost. Eliminating the need for heavy equipment was especially helpful when dealing with challenging site conditions. In addition, the ability to nest smaller diameter composite pipe within larger diameter pipe reduced shipping costs.

O-Tek manufactured the pipe using licensed Flowtite technology. The process combined continuous and chopped glass fibers in a Vipel polyester formulated to proprietary Flowtite specifications. The smooth pipe interior ensures excellent flow properties that allow for smaller diameters than pipe made with alternative materials. The Vipel resin is engineered to provide decades of corrosion-resistant service.

### About O-tek Internacional

O-Tek Internacional S.A. is located in Medellin, Colombia, and is part Grupo de Inversiones Mundial (IMSA), also headquartered in Medellin. IMSA is licensed to produce composite Flowtite™ pipe using technology provided by Flowtite Pipe Amiantit's Technology Center in Sandefjord, Norway. Other O-tek products and services include production and installation of water storage tanks and trenchless pipe rehabilitation.

### About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic material systems for composites and cast polymers. For more information on AOC technology, quality and service, e-mail [corrosion-resins@aoc-resins.com](mailto:corrosion-resins@aoc-resins.com), phone (866) 319-8827, or go to [AOC-RESINS.com](http://AOC-RESINS.com).

